

PRELIMINARY AMENDMENT

Serial Number: Unknown

Filing Date: Herewith

Title: IMPLANTABLE INTRAVENOUS CARDIAC STIMULATION SYSTEM WITH PULSE GENERATOR HOUSING SERVING AS
OPTIONAL ADDITIONAL ELECTRODE

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cont
Patent No. 5,713,926, which is a continuation of U.S. Patent Application No. 07/917,899, filed July 24, 1992, now U.S. Patent No. 5,385,574, which is a continuation-in-part of U.S. Patent Application No. 07/514,251, filed on April 25, 1990, now U.S. Patent No. 5,133,353, the specifications of which are incorporated herein by reference.

On page 8, after line 6, please insert the following:

FIG. 16 is a block diagram illustrating the pulse generator.

FIG. 17 is a block diagram showing the programmable switch.

The paragraph beginning on page 8, line 25, has been amended as follows:

Referring now to Figures 3 and 4, a pulse generator housing of a second embodiment is illustrated at 10'. Housing 10' is similar to housing 10 of Figures 1 and 2 except the side wall 12' includes a conductive mesh surface 14'. It is to be understood that, hereinafter, the term "mesh" includes that as illustrated as well as any other high surface area conductive materials including microtextured materials. As shown in Figure [6] 4, conductive mesh surface 14' is electrically connected via switch 16 to pulse generator circuitry 18 contained within housing 10'. In addition a separate conductive patch (not shown) could be added and connected to the bottom of the pulse generator housing to increase the conductive surface area. This patch could attach by a snap or other similar means to the housing.

The paragraph beginning on page 13, line 11, has been amended as follows:

[When] Referring additionally to FIG. 17, when an arrhythmia is sensed where it is appropriate for an electrical pulse to be delivered to the heart 38, the programmable switch 16 determines which electrodes are energized under control of circuitry 18. The switch is programmed so that it can select any combination of three electrodes, such as, for example, any combination of the right ventricular (RV) electrode 28, pulse generator electrode surface 14 and superior vena cava (SVC) electrode 42. The superior vena cava electrode 42 may be replaced by a subcutaneous electrode. The RV electrode is connected to terminal 22a and the SVC or

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subcutaneous electrode is connected to terminal 22b. The pulse generator conductive surface would be electrically connected in common with the SVC or subcutaneous electrode. The switch 16 may be programmed to discharge the RV electrode against the SVC (or subcutaneous) electrode and/or the pulse generator electrode surface(s).

The paragraph beginning on page 15, line 1, has been amended as follows:

Figure 7 illustrates a pulse generator housing 50 according to a third embodiment. The housing 50 is comprised of a titanium body 52. The internal pulse generator circuitry 18 and programmable switch 16 are connected to the body 52 as described in conjunction with Figure 2. The entire outer surface of the body 52 may be conductive or selective surface portions may be made insulative. Specifically, as shown in Figures 8 and 9, an insulative ceramic material [20] 70 may be sputtered (e.g. high energy plasma deposition) onto the conductive outer surface of the body 52. This is useful to create a conductive surface which has a controlled current density, in much the same manner as recently developed defibrillation cardioversion patch electrodes. See, for example, commonly assigned U.S. Patent[,] No. 5,036,932. The insulative material may take the form of a mask or in various patterns known to control current density across a conductive surface. The insulative material may also take the form of silicone rubber.

On page 16, after line 16, please insert the following paragraph:

Referring to FIG. 16, pulse generator circuitry 18 has full-function pacing capabilities (pacer 80) including pacing for bradycardia and tachycardia both to inhibit an intrinsic beat or to adapt the rate to a higher or lower rate. In addition, circuitry 18 has cardioversion and defibrillation capabilities (cardioverter/defibrillator 82) and includes cardiac detection circuitry 84 capable of distinguishing when the heart is in normal sinus rhythm, should be paced, or requires higher energy cardioversion, or even higher energy defibrillation. The switch 16 is selectively activated to include or exclude the conductive surface of side wall 12 from the discharge sequence.

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